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AUTHOR Stein, Judith A.; And Others
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ABSTRACT

This study examined whether and at what time point various interpersonal and intrapersonal correlates of smoking shifted over four assessment points in a longitudinal study of 461 individuals. The study began when the subjects, who had been participating in a study of adolescent and young adult development were in junior high school. Four assessment points, 4 years apart were available for this study. Latent variables representing Cigarette Use, Social Relations, Extraversion, and Depression were intercorrelated within each time period. As hypothesized, a substantial shift in the patterns of intercorrelations was found over time. At Time 1, when the subjects were in junior high school and may be described as experimenters, Cigarette Use was positively correlated with good Social Relations and Extraversion, and negatively with Depression. Only four years later Cigarette Use was significantly and positively correlated with Depression, negatively correlated with good Social Relations, and only minimally correlated with Extraversion. At Times 3 and 4 when subjects were in their early and late 20s the same pattern emerged of a significant positive correlation between smoking and Depression, a negative correlation with good Social Relations, and a minimal correlation with Extraversion. These results indicate that smoking in response to peer pressure alone may not continue; those who continue smoking may use it to relieve tension and for self-medication. (Author/ABL)

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Changing Correlates of Cigarette Smoking from Adolescence to Adulthood

Judith A. Stein
University of California, Los Angeles

Michael D. Newcomb
University of Southern California

Peter M. Bentler
University of California, Los Angeles

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ABSTRACT

There is a contradiction between reported correlates of cigarette smoking depending on whether one is describing initiation or maintenance of the habit. Youthful smokers are often portrayed as more extraverted and involved with their peers than those who do not smoke, while older smokers are often depicted, especially in the medical literature, as depressed and withdrawn. Meanwhile, once smoking starts, the behavior is highly stable. In recognition of this contradiction, we investigated whether and at what time point various interpersonal and intrapersonal correlates of smoking shifted over four assessment points in a longitudinal sample of 461 individuals. The study began when the participants were in junior high school; they have been surveyed every four years. Latent variables representing Cigarette Use, Social Relations, Extraversion, and Depression were intercorrelated within each time period. As hypothesized, we found a substantial shift in the patterns of intercorrelations over time. At Time 1, when the subjects were in junior high school and may be described as experimenters, Cigarette Use was positively correlated with good Social Relations and Extraversion, and negatively with Depression. Only four years later, Cigarette Use was significantly and positively correlated with Depression, negatively correlated with good Social Relations, and only minimally correlated with Extraversion (.03). At Times 3 and 4, when subjects were in their early and late 20's, the same pattern emerged of a significant positive correlation between smoking and Depression, a negative and significant correlation between smoking and good Social Relations, and a minimal correlation with Extraversion. Meanwhile, Cigarette Use was highly stable over time, but least stable between Time 1 and Time 2 (.50). The stability between Time 2 and Time 3 was .73; between Time 3 and Time 4 it was .83. These results indicate that smoking in response to peer pressure alone may not continue; those who continue smoking may use it to relieve tension and for self-medication. These results have implications for those planning anti-smoking campaigns among adolescents.

INTRODUCTION

Smoking is the principal cause of preventable death in this country and kills 390,000 Americans each year (National Commission on Drug-Free Schools, 1990). Since smoking is the biggest health problem in the country, initiation of smoking and subsequent maintenance of the habit is of great concern to those interested in the public health. The vast majority of smokers began the habit in their early teens; practically no one initiates regular smoking after age 21 (O'Malley, Bachman, & Johnston, 1988). However, nearly all teenagers experiment with smoking at least once or twice (Newcomb, McCarthy, & Bentler, 1989). Obviously, not all experimenters become regular smokers. Thus, the dynamics of becoming a regular smoker may be quite different from those that engender experimental smoking.

In the present study we explore different determinants and correlates of initiation and maintenance of smoking in a longitudinal sample. This interest arose because we perceived what appeared to be a contradiction in two separate research areas on smoking, each usually derived from cross-sectional studies. In smoking initiation studies, experimentation in adolescence has been associated with peer involvement and personality traits such as extraversion and sociability. However, correlates such as poor socialization and depression have been reported among older regular smokers, often in the medical literature (eg., Anda et al., 1990; Glassman et al., 1988; Glassman et al., 1990).

How can these apparently disparate trends be reconciled? Do extraverted, sociable teenaged smokers become depressed, introverted adults? Given the relative stability of personality traits, this appears unlikely (Stein, Newcomb, & Bentler, 1986). Depression has been shown to be quite stable, as has smoking. Our hypothesis was that among the many teenagers who initially experiment with cigarettes, those who persist in smoking into adulthood are those who have found it especially ameliorative or a mechanism for relief from negative affect.

We also hoped to determine if and when the shift in correlates of smoking occurs. We predicted that at the critical time between the earliest experimentation with cigarettes and late adolescence, the shift in correlates would occur. Supporting this hypothesis, Labouvie, Pandina and Johnson (1991) found that drug use was more socially oriented before the age of 15. However, between 15-18 years, further increases and maintenance of regular drug use was predicted by stressful experiences, and a less social orientation. We further expected that smoking would evidence the least stability between early and late adolescence but would become increasingly stable into adulthood, due to the addicting effect of nicotine as well as its self-medicating properties especially among those experiencing negative affect and stress.

METHOD

Subjects

Respondents were 461 men (N = 133) and women (N = 328) who have been participating in a longitudinal study of adolescent and young adult development (Newcomb & Bentler, 1988). The subjects used in the present study are those that have responded to every survey wave. They were originally recruited when they were in grades 7 through 9 in several junior high schools in the Los Angeles County area. Four assessment points, four years apart, were available for the present study. Table 1 provides a description of the sample at the fourth survey wave.

Measures

Where possible, more than one manifest variable was used as an indicator of the latent constructs used in these analyses. These latent constructs include Cigarette Use, Depression, Good Social Relationships, and Extraversion. Only at Year 1, when the subjects were in junior high school, were single variables available for Cigarette Use, Depression, and Good Social Relationships. However, these manifest variables, except Cigarette Use, in turn had been indicated by responses to several single items which were combined to form the measure.

Analyses

The data were analyzed with the EQS structural equations program (Bentler, 1989) using maximum-likelihood estimation. Goodness-of-fit of the models was evaluated with the Non-Normed Fit Index (NNFI: Bentler, 1989), the Comparative Fit Index (CFI: Bentler, 1990), and also with chi-square/degrees of freedom ratios. A confirmatory factor analysis (CFA) tested the factor structure of the hypothesized model and also provided correlations among the factors. All factors were allowed to freely correlate among themselves. Covariances between similar manifest variables were allowed as well. In addition, the stability paths were calculated separately for each construct.

RESULTS

Confirmatory factor analysis

The confirmatory factor model fit the data quite well. This model allowed all latent constructs to intercorrelate freely and also allowed covariances (correlations) between similar manifest variables across time. No parameters were dropped from this model even if they were not significant. The NNFI was .93, the CFI was .94. The chi-square value was 1362.58 with 683 degrees of freedom, a ratio of less than 2:1.

Within-Time Correlations: Of particular interest are the correlations between the within-time constructs with Cigarette Use. (See Table 2.) Year 1 Cigarette Use was negatively associated with Depression ($r = -.09$, $p \leq .05$), Good Social Relationships ($r = .31$, $p \leq .001$), and Extraversion ($r = .25$, $p \leq .001$). This result supported the first hypothesis of this study that initial smokers would demonstrate this pattern.

In examining the within-time correlations between the same constructs at Years 5, 9, and 13, a different pattern emerged. As hypothesized, we found a substantial shift in the patterns of intercorrelations. Four years after the time of initial experimentation, Cigarette Use was significantly and positively correlated with Depression (.19, $p \leq .001$), negatively correlated with good Social Relations (-.14, $p \leq .01$), and only minimally correlated with Extraversion (.03). At Years 9 and 13, when the subjects were in their early and mid 20's, the same cross-sectional pattern remained of a significant positive correlation between Cigarette Use and Depression (Year 9 = .19; Year 13 = .18), a negative and significant correlation between smoking and good Social Relations (Year 9 = -.13; Year 13 = -.12), and a minimal correlation with Extraversion (Year 9 = .05; Year 13 = .06).

Stability Model

In the models assessing construct stability, Cigarette Use was stable over time, but demonstrated increasing stability over time. (See Figure 1.) Between Year 1 and Year 5 the standardized regression coefficient was .50. The stability between Year 5 and Year 9 was .73; between Year 9 and Year 13 it was .84. Depression evidenced an increasing pattern of stability as well. The Year 1 measure of Social Relations was not a significant predictor of subsequent Social Relations; however, the Years 5, 9, and 13 Social Relations constructs demonstrated increasing stability over time. Extraversion, which was measured in exactly the same manner at all four time periods, evidenced a great deal of stability. This may reflect the fact that the measures were alike and also that a personality trait like extraversion itself is very stable.

DISCUSSION

This study assessed whether and to what extent personality and social correlates of smoking changed from early adolescence to adulthood. As was hypothesized, the pattern of interrelationships among the personality- and socially-oriented variables, and smoking changed substantially between early and late adolescence. Supporting the conclusions of Labouvie et al. (1991) regarding general drug use, we also found socially-oriented individuals more likely to be smoking before the age of 15. Smoking was positively correlated with cheerfulness, extraversion, and good social relations. However, only four years later, we found that maintenance of higher levels of smoking was associated with poorer social relationships, and more reported negative affect, again supporting the results of Labouvie et al.

The lower stability of smoking behavior between early and late adolescence indicated that a substantial number of the early smokers dropped the habit or never fully developed it. We would speculate, due to the demonstrated stability of the other constructs, that those discontinuing smoking were those who had smoked for social reasons rather than for relief from stress. Similarly, Kandel and Raveis (1989) found cocaine and marijuana users more likely to stop using those substances when they had used them in response to social influence than for psychological reasons. The same mechanism may be operating among young individuals who smoke, initially for social reasons. If they do not "get anything" out of it, they may not continue. However, if smoking provides relief from negative affect, along with pleasurable sensations, and a feeling of relaxation, they will continue. By adulthood, the addictive nature of cigarettes is dominant: Stability of smoking between the early and mid-twenties was remarkably high (.84).

Our results indicate that an effective prevention program in elementary school or junior high school will not necessarily be applicable to one in senior high school. Fostering techniques for peer-resistance might be more applicable among the youngest smokers while stress-reduction and developing positive coping skills might be more effective among high school students. Those planning smoking prevention programs should take into account the changing dynamics of cigarette smoking over time revealed in these analyses.

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Table 1

Characteristics of the Sample

	Male (N=133)	Female (N=328)	Total (N=461)
Age (years)			
Mean	25.46	25.48	25.47
Range	4	3	4
Ethnicity (%)			
Black	6.8	13.1	11.3
Hispanic	10.5	11.0	10.8
White	72.2	62.8	65.5
Asian	9.8	11.6	11.1
High Sch. Graduate (%)			
Yes	96.2	94.2	94.8
No	3.8	5.8	5.2
Number of Children (%)			
None	77.4	64.9	68.5
1	15.0	20.1	18.7
2	6.0	10.7	9.3
3	.8	4.0	3.0
Income for the Past Year (%)			
<5,000	7.6	18.9	15.6
5,001-15,000	28.5	26.6	27.1
15,001-30,000	42.8	45.7	44.9
>30,000	21.1	8.8	12.4
Living Situation (%)			
Alone	9.0	7.6	8.0
Parents	19.5	19.8	19.7
Spouse	42.1	40.2	40.8
Cohabitation	7.5	8.5	8.2
Dormitory	2.3	0.6	1.1
Roommates	12.8	14.7	14.1
Other	6.8	3.5	8.0
Current Life Activity (%)			
Military	5.3	0.3	1.7
Junior College	2.3	2.1	2.2
Four Yr. College	9.0	4.9	6.1
Part time job	5.3	7.0	6.5
Full time job	72.2	67.1	68.5
Child rearing/homemaker	0.8	15.2	11.1
Other	5.3	3.4	3.9

Table 2.

Correlations between Cigarette Use and other Latent Constructs within Time

	Cigarette Use Year 1 Early Adolescence	Cigarette Use Year 5 Late Adolescence	Cigarette Use Year 9 Young Adulthood	Cigarette Use Year 13 Adulthood
Depression	-.09*	.19***	.19***	.18***
Good Social Relationships	.31***	-.14**	-.13**	-.12**
Extraversion	.25***	.03	.05	.06

*p ≤ .05; **p ≤ .01; ***p ≤ .001.